

CANADIAN GEOGRAPHICAL JOURNAL

NOVEMBER
1943

VOL. XXVII
No. 5



\$3.00 A YEAR

35c A COPY



Over There
it's a question in
every man's mind

Industry is helping win the war...
industry must help build a peacetime world

After the war is decisively won...
what kind of world is essential for a just and durable peace?

This question is being asked to-day everywhere in the world. No expert is needed to tell you the answer.

It must be a world as peaceful and neighbourly as your own town; a world in which decent people can bring up their children decently. It must be a busy world where factories and farms are working and where there are jobs for all.

How can such a world be brought into being? The surest way is to think and talk about it. Full and complete discussions on the porches of this country, over its fences, in churches, schools, clubs, and always at meals — that is how the terms of A JUST AND DURABLE PEACE can be formulated.

In your discussions keep in mind this fact; your terms of peace must be such that the people of other lands can agree with them. There must be provision in your plans for sustained production and for consumption of that production.

Only a world peace that squares with the conscience of men of good-will can be just. Only a just peace can endure.

**THE INTERNATIONAL NICKEL COMPANY
OF CANADA, LIMITED
25 King Street West, Toronto**

Over Here
people are looking
for the answer



CANADIAN GEOGRAPHICAL JOURNAL

Published monthly by
The Canadian Geographical Society
at 2151 Ontario St. E., Montreal

Editor

Gordon M. Dallyn

This magazine is dedicated to the interpretation, in authentic and popular form, with extensive illustrations, of geography in its widest sense, first of Canada, then of the rest of the British Commonwealth, and other parts of the world in which Canada has special interest.

Contents

NOVEMBER 1943

VOLUME XXVII No. 5

COVER SUBJECT:—At sea on board H.M.C.S. *Iroquois*

	PAGE
THE ROYAL CANADIAN NAVY, 1942-1943 by LIEUTENANT-COMMANDER WILLIAM STRANGE	202
THE "CANOL" PROJECT — Canada Provides Oil for the Allies by OLIVER B. HOPKINS	238
EDITOR'S NOTE-BOOK	VIII
AMONGST THE NEW BOOKS	VIII

• • • •

The articles in this Journal are indexed in the *Reader's Guide to Periodical Literature* and the *Canadian Periodical Index* which may be found in any public library.

The British standard of spelling is adopted substantially as used by the Dominion Government and taught in most Canadian schools, the precise authority being the Oxford Dictionary as edited in 1936.

Contents of this Journal are copyright.

Address all communications regarding change of address, non-delivery of Journal, etc., to the publication office, 2151 Ontario Street, East, Montreal, Canada, giving old and new address. On all new memberships, the expiry date will be printed on wrapper containing starting number. This will constitute a receipt for subscription.

Membership in The Canadian Geographical Society is \$3.00 per year in Canada and other parts of the British Empire, which includes delivery of the Journal, postpaid; in United States, Mexico, France, Spain, Central and South America, \$3.50; in other countries, \$4.00. Make membership fee payable at par in Ottawa.

Member Audit Bureau of Circulations.

Special Representatives:

Ontario: F. A. Dallyn, 21 King Street, E., Toronto, (Tel. EL. 2863)
Quebec: F. A. Dallyn, 2151 Ontario Street E., Montreal, (Tel. FR. 1722)
Europe: Norah C. Perry, 5 Upper Dagnall Street, St. Albans, Herts., England

Entered as second-class matter at the Post Office, Montreal, Canada.

PRINTED IN CANADA



"The shadow of the fleet". Canada's ever increasing sea might is dramatically portrayed in this striking photograph by Navy cameraman Lieut.-Commander G. Richardson, taken from the quarter-deck of the new 'Tribal' destroyer, H.M.C.S. *Iroquois*.

THE ROYAL CANADIAN NAVY 1942-1943

By Lieut.-Comdr. William Strange

ANOTHER year of war by sea has passed. In many ways it has closely resembled its predecessors. For the men at sea, it has consisted, as ever, of mile upon hard-won mile of ocean passage, won against the weather and the enemy. It has been a continuation of the wearisome, and seemingly unending, task of delivering the necessities of modern warfare to those places where the need is greatest.

The men of the Royal Canadian Navy, backed by the colossal enterprise represented by the shipyards, supply industries, the countless and greatly increased facilities at the naval bases and training establishments, have once again escorted a huge and telling tonnage of material across the timeless danger-laden wastes.

Primarily an anti-submarine Navy, the R.C.N. has, however, greatly increased its weight of effort in the past twelve months. Literally hundreds of attacks have been carried out against U-boats from the Caribbean Sea to the Mediterranean. Published successes, which fall very far short of indicating the extent of the convoy-defence provided by the Navy, now number six U-boats. Over 400 of our seamen have received hard-earned awards for deeds of gallantry.

There never was a time when casualties — both of ships and men — were not a cause for grief: yet who, measuring the main achievement and its inevitable heavy impact upon the course of the war, will say the cost was high? Some 1,100 officers and ratings have been lost, and thirteen ships. Against this must be placed, not only the certain and published successes against the enemy, but the feeding and general supply of great bodies of troops and airmen, as well as the immense contribution to the maintenance of the existence of Great Britain.

The fact is that the one-time 'tin-pot' Canadian Navy (as the unthinking were once wont to describe it) has been quietly influencing the course of history these past twelve months. It has continued to repay the determination and foresight of that small devoted band who held it in being

during its leanest years, and has so aided the cause of Free Men that a British Admiral was some time ago impelled to say: "The Canadian Navy solved the problem of Atlantic convoys".

Considering that the Admiral in question was Sir Percy Noble, who commanded Britain's Western Approaches during the most desperate days, these words provide a pleasant smoke in the Navy's pipe. It is not to be forgotten that failure to solve this problem might well have meant the loss of the war.

The Royal Canadian Navy, as it stands and fights to-day, is worth looking at. The expansion carried on during the past year alone is a notable contribution to our country's history, worthy of record and of study.

A total of about 100 ships has been added to our fighting strength, and to those ancillary services which maintain it. Amongst these the most interesting are the new 'Tribal' class destroyers — *Huron*, *Iroquois*, *Athabaskan* and *Haida*. A fifth, H.M.C.S. *Micmac*, was launched, after christening by Mrs. Angus Macdonald (wife of the Minister of National Defence for Naval Services) on September 18, immediately prior to the laying of the keel for the seventh. The sixth is in her crib at the same shipyard, and is to be launched shortly.

By the time the present building programme is completed Canada will have eight of these, the fastest and hardest hitting destroyers in the world. Of these, four will have been built in Canadian shipyards.

The Canadian 'Tribals', inheriting a most determined and enviable fighting record from their prototypes of the Royal Navy, are a great advance on any fighting ship that has been in our Navy hitherto.

With a speed of beyond 36 knots, carrying eight guns of 4.7" calibre, twin-mounted in four turrets; with four torpedo tubes, as well as heavy anti-aircraft and plenty of secondary armament, they are capable of inflicting severe damage on any



Keeping the sea-lanes clear is the job of the Royal Canadian Navy, and speedy sub-chasing motor launches of the 'Fairmile' class are playing an important role in this wearisome and seemingly unending task. Here a depth-charge explodes abaft the stern on an M.L., in the foreground can be seen the gun's crew and depth-charge party closed-up at action stations.

surface craft afloat. It will be remembered that it was a vessel of this class, H.M.S. *Zulu*, which scored a telling torpedo-hit on the *Bismarck*.

Needless to say, these ships carry also an adequate quota of depth-charges, and are fitted with all the most modern anti-submarine devices — both for detection and attack — known to the experts of the Admiralty. They displace something over 1,800 tons, have a complement of over 200 officers and ratings, and constitute an important step toward the acquisition of what the Hon. Angus L. Macdonald has described as a 'balanced Navy'.

It is, perhaps, significant that, only a few days before the launching of H.M.C.S. *Micmac*, the Naval Minister at a Press Conference in Ottawa expressed the opinion that within a year two new six-inch gun cruisers might be included within the Royal Canadian Navy. "Up to now," he observed, "we have had largely an anti-submarine Navy; but to make a balanced Navy we have got to have cruisers."

Canada's 'Tribals' are not regarded primarily as anti-submarine vessels, and are now serving with striking forces of the Royal Navy. In this employment, as might be expected, they have already been privileged to encounter the enemy.

Another new class of warship added to Canada's Navy is the 'Frigate'. The steady intensification of the crucial U-boat campaign has naturally led to continuous development of defensive measures—not only in regard to the equipment carried in warships, but actually in the warships themselves.

The frigate is the outcome of long and hard experience, and has been specifically designed to meet even the heaviest demands that may be made upon anti-submarine craft. In essence, this new type of warship may be described as the half-way mark between the corvette and the destroyer. It is not possible, at this date, to publish very much in the way of detailed information. The great advances, however, are in speed, fire-power and increased comfort in the crews' quarters — a scarcely less important item, when the hardships encountered in the North Atlantic are taken into consideration.

Just as, in the earlier months of the war, Canadian shipyards responded to the demand for corvettes, so have they met the demand for this faster, and heavier type of escort vessel. The frigate shows every sign of becoming the most deadly surface enemy that the U-boat has so far encountered, as it can be built in quantity.

On June 7th, 1943, the announcement was made by Mr. Macdonald of the receipt by Canada of a gift of four destroyers, similar to those already possessed by the R.C.N., from the Government of the United Kingdom. Considering the steady increase of the Canadian responsibilities in the Atlantic, no more useful acquisition could have been made.

These ships, formerly the *Griffin*, *Decoy*, *Express* and *Fortune*, have been renamed *Ottawa*, *Kootenay*, *Gatineau* and *Saskatchewan*. Their record in this war is already very impressive. Their service with the Royal Navy collectively covers a

Minister for Naval Services, the Hon. Angus L. Macdonald, inspects guard of honour on one of his many trips to naval bases.





Smoke billows astern of H.M.C.S. *Iroquois* as she fires a salvo. Manned entirely by Canadian officers and ratings, the new 'Tribal' destroyers of the Royal Canadian Navy are the most heavily armed and fastest in the fleet.

great number of the actions which, in this war, have added to the illustrious name of the Navy as a fearless fighting service, continuously capable of carrying out the most arduous and dangerous tasks.

The new *Ottawa* has fought in the fjords of Norway, was present at the amazing victories of Cape Matapan and Taranto, helped evacuate British troops from the holocaust at Crete, has bombarded Bardia and steamed many miles as a unit of the famed Dover Patrol. *Kootenay* was one of the two ships responsible for sinking an Italian submarine approximately twenty minutes after Italy entered the war! She has run through "Bomb Alley", taking convoys into Malta, and took a part in the capture of Madagascar.

Saskatchewan is no stranger to Canadians, for she formed a part of the naval escort force which safely brought the First and Third Canadian Divisions to play their part in manning the Island

Fortress of Britain. *Gatineau* was a part of that amazing fleet which accomplished the miracle of Dunkirk, and was one of the destroyers which performed such valuable rescue work following the tragic loss of the *Prince of Wales* and the *Repulse* in Eastern waters.

Each of these ships has, of course, undergone the most extensive refit. They are now amongst the most completely efficient vessels of the Canadian Navy, and provide at once a notable increase in our destroyer strength and an expression of Great Britain's confidence in the ability of Canadians to carry on the magnificent record they have established.*

In early June of this year, there took place an operation which has subsequently focused attention upon what had, until this time, been regarded as one of the most humdrum jobs undertaken by naval personnel in the whole war — the business of minesweeping off the port of Halifax.

*Ref. Nov. issues, 1940, 1941, 1942, Canadian Geographical Journal

The Canadian Navy has had built, and has manned, a number of minesweepers — amongst which are those of the new 'Algerine' class, added to the R.C.N. this year. Whilst the sweepers of this class are primarily designed for anti-mine work, they are fully capable of combining this duty with that of escorting convoys. Some, indeed, are so employed, and are regarded by many as being quite as good as corvettes for the job.

It was, however, a much smaller class of minesweeper which successfully dealt with the new peril to shipping cunningly laid by the enemy in June.

For security reasons, no inkling of the story was allowed to reach the public until toward the end of September. When the story came out, the facts were somewhat electrifying.

A mine-field was first discovered and reported by ships of a convoy escort force. Its extent was not, of course, at that time known. Since the beginning of the war, the ships of the 'Black Ensign'

fleet had been steadily ploughing their way through the sea-lanes leading in and out of the port of Halifax, hopefully sweeping, and suffering the daily disappointment of the inveterate fisherman compelled to do his fishing in some lake or stream wherein no fish are to be found. The receipt of the news of actual mines sent them to the area concerned in very short order.

Within one day, a channel 1,200 yards wide was cleared. The sole loss attendant upon the enemy's attempt to close the port was one small freighter, of some 2,000 tons, believed to have been mined in June. This ship, however, was a straggler, and was four miles inside an area which the Navy had declared as dangerous. Even at that, no lives were lost.

The sweeping of a single channel, however, was but part of the Navy's task. The swept channel had to be maintained in safe condition, further exploratory sweeps had to be made so as to determine the extent of the mine-field, and the mines themselves had to be exploded — an

Here are the ships of the 'Black Ensign' fleet, the tough little minesweepers who for three and a half years have frustrated the attempts of enemy mine-layers to bottle up the port of Halifax with high explosive mines.





Lieut. E. McNally, R.C.N.V.R., in the above and facing drawings, has caught with sure, graphic lines some of the many phases of life at sea.

extremely dangerous operation, which was ultimately carried out entirely without loss.

The speed and determination with which the mines were disposed of earned the official commendation of the British Admiralty.

The operations were, of course, heartily welcomed by officers and ratings of minesweepers who, for weary months, had been carrying out humdrum duties which, at times, must have seemed to them no more than the most minor contribution to Canada's naval activity. For two weeks the ships concerned were kept on the job for twenty hours daily. During this period there was not one single defaulter, and, despite the heavy calls upon both the courage and the endurance of the men concerned, not one single case of 'grousing'.

Many interesting and amusing stories regarding this operation have since come to light, not the least amusing of which is that of the tiny minesweeper which got off her course. Simultaneously with the discovery that she was somewhat out of position came a thunderous and resounding roar. A vast column of water shot skywards, and the ship reeled from the shock of the explosion.

A moment later, the senior ship of the little fleet signalled for a report. Highly delighted with the thunderous disappearance of another threat to shipping, the skipper of the minesweeper made reply: "Off our course, but by guess and by God—we got a mine!"

However light-hearted may be the Navy's approach to its many tasks, whether the job of the moment be minesweeping, convoy escort, pursuit of the enemy in one or other of his various manifestations, or any of the other dozen and one "chores" of the Naval Service, the success of the mission is always largely dependent upon the background of training against which it must inevitably be set. The advances in training made by the Royal Canadian Navy in the past twelve months are great.

The most notable new training establishment is located at Deep Brook, in Nova Scotia. Significant of the steady

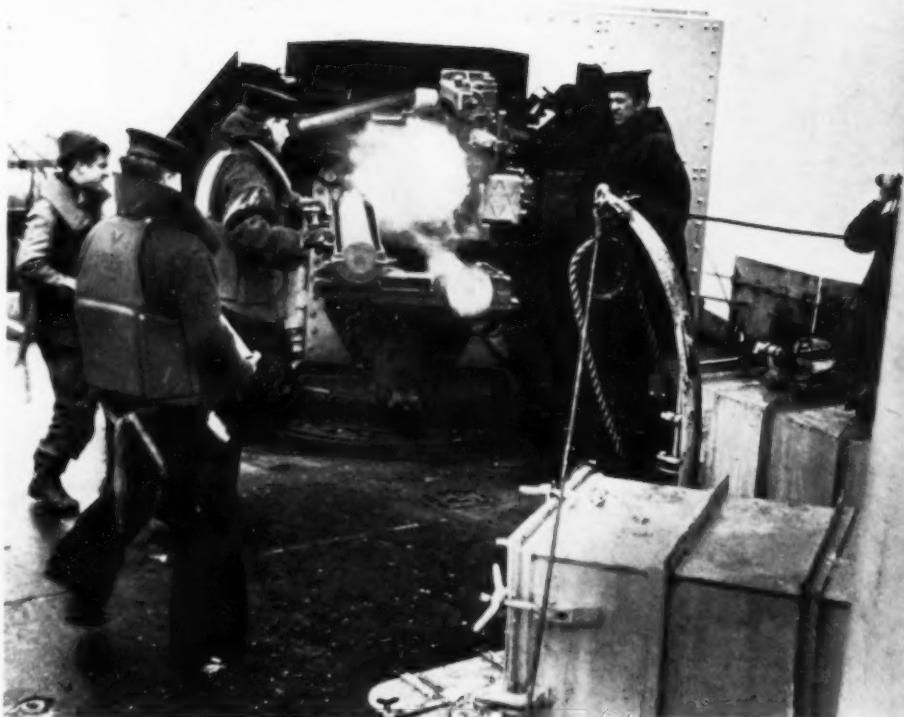






Upper left shows H.M.C.S. *Iroquois* as she plows through a heavy sea, returning to England from her visit early this year to Canada. Lower left:—With gun's crew closed-up at action stations, these Fairmiles are shown patrolling the coastal shipping lanes. Upperright:—The after lookout on a Canadian destroyer keeps the convoy and surrounding area under his glasses.

Right:—The gun crew aboard H.M.C.S. *Skeena* at target practice. One cordite casing is being ejected after the first round while the charge and projectile are in the tray at the left ready for the next round.





Lieut. Anthony Law, R.C.N.V.R. Commanding Officer of a motor torpedo boat, graphically portrays in the above painting their attack on a German battle squadron in the English Channel. Below:—Lieut. Rowley Murphy R.C.N.V.R. paints a corvette and destroyer refitting at an Eastern Canadian port.



increase in Canada's power by sea is the fact that it is the largest naval training establishment in the British Empire.

Occupying some eight hundred acres of land rolling to the salt water of the sheltered Annapolis Basin, with almost one hundred buildings to provide accommodation for personnel, workshops, classrooms, and the many and varied offices necessary, it was erected in a single year at a cost of some twelve million dollars.

In relation to the importance of the Navy's task, now extending to the protection of close to half the trade-convos of the North Atlantic (each convoy worth some hundreds of millions), the 'insurance' represented by this magnificent training base is very low.

Named — in accordance with naval custom — as a ship, H.M.C.S. *Cornwallis* is actually a small city. The coal dump will store 20,000 tons. The gun-battery is the longest in the world. It has its own hospital, post office, bank, water-supply and railroad siding. The parade-ground, five acres in extent, can handle six thousand men.

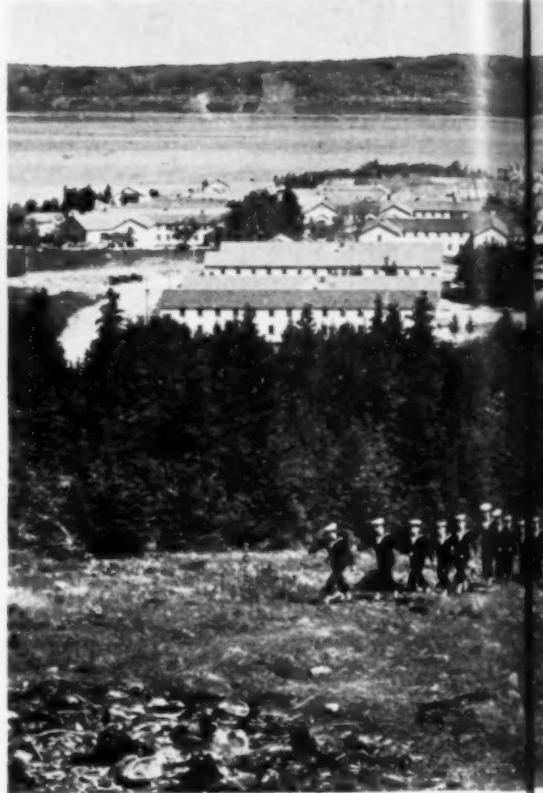
H.M.C.S. *Cornwallis* does not replace the eighteen Divisions of the Royal Canadian Naval Volunteer Reserve, through whose hands have passed upwards of 50,000 naval recruits since the outbreak of the war. These Divisions, placed in strategic centres from one coast to the other, have performed yeoman service in the past, and will certainly continue to do so. The purpose of the new establishment is to take budding seamen, following their initial training, and to carry them forward to the point where they will be fully trained by the time they find themselves at sea under actual operational conditions.

Almost the entire advanced training, both of officers and ratings, has been centralized at Deep Brook. The benefits of this full co-ordination of training activities may well be incalculable.

The landward aspect of the training now made possible by the installation of the most up-to-date methods and equipment is surprisingly complete. The em-

Captain J. M. Grant, R.C.N. (upper right) commanding Officer of the Royal Canadian Naval College at Royal Roads near Victoria, B.C. Below is captain J. C. I. Edwards, R.C.N., Commanding Officer of H.M.C.S. *Cornwallis*, Deep Brook, N.S., Canada's new naval training establishment which rivals anything of its kind in the world.

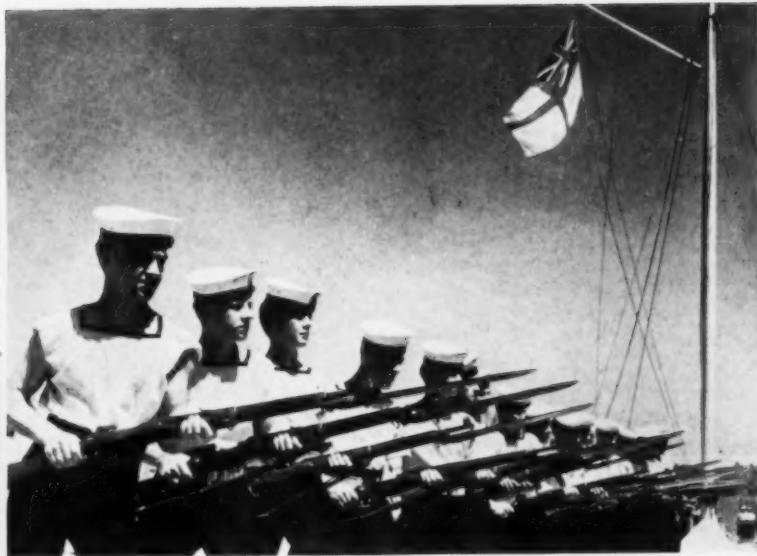
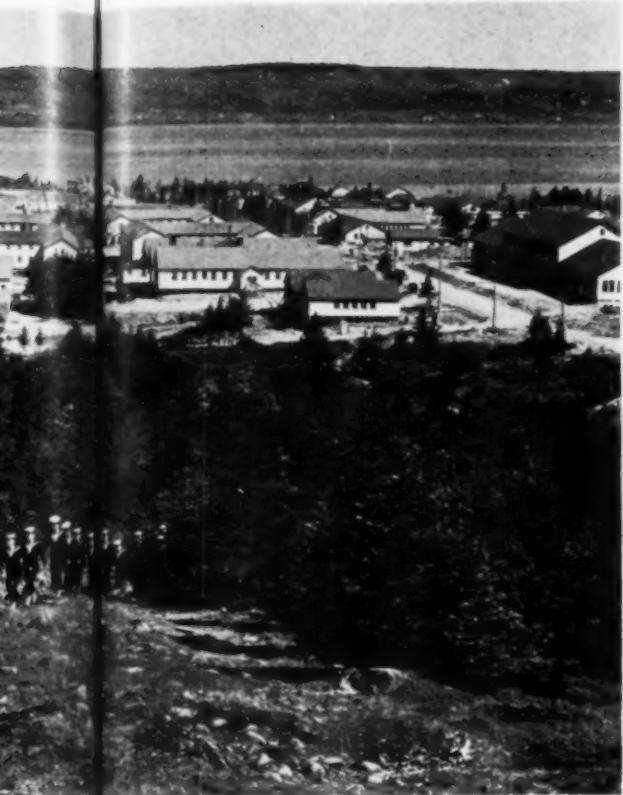




H. M. C. S. Cornwallis the new naval training establishment is one of the most efficient and modern of its kind in the world. Covering more than 800 acres on the shores of Annapolis Basin in Nova Scotia, its purposes are simple. It will take semi-trained ratings from basic training establishments and turn

Top:—New entry ratings march smartly through the entrance to Cornwallis. Below:—The Navy insists that its men receive the best physical and recreational training possible. Right:—With hundreds of ratings passing through this base every week, on leave or on duty, the establishment has its own railway station.





al training
ufficient
Cover-
ores of
purposes
ratings
d turn

them into practical seamen; it will teach ratings with sea experience to operate and maintain complicated equipment and to keep up-to-date with constant innovations to such equipment. Similarly with officers, new entry officers will be given training in technical equipment, and those with sea experience will be trained for specialist duties.



Top:—Every rating must know how to handle a rifle and bayonet — here new entries receive instruction in hand-to-hand fighting. Below:—In the sheltered waters of Annapolis Basin, the new entries receive practical instruction in seamanship from experienced instructors. In addition to the regular classes, they engage in cutter and whaler races on fine evenings.

Cadets at the Royal Canadian Naval College receive competent instruction from an experienced Warrant Officer of the R.C.N. Below:—Every cadet, in spite of diesel and steam driven ships of war, must have first-hand knowledge of seamanship and sailing.



Centre:—Lieut-Governor W. C. Woodward of British Columbia inspects the first graduating class of the recently opened naval college. Right:—A lighter moment after the graduation ceremonies.

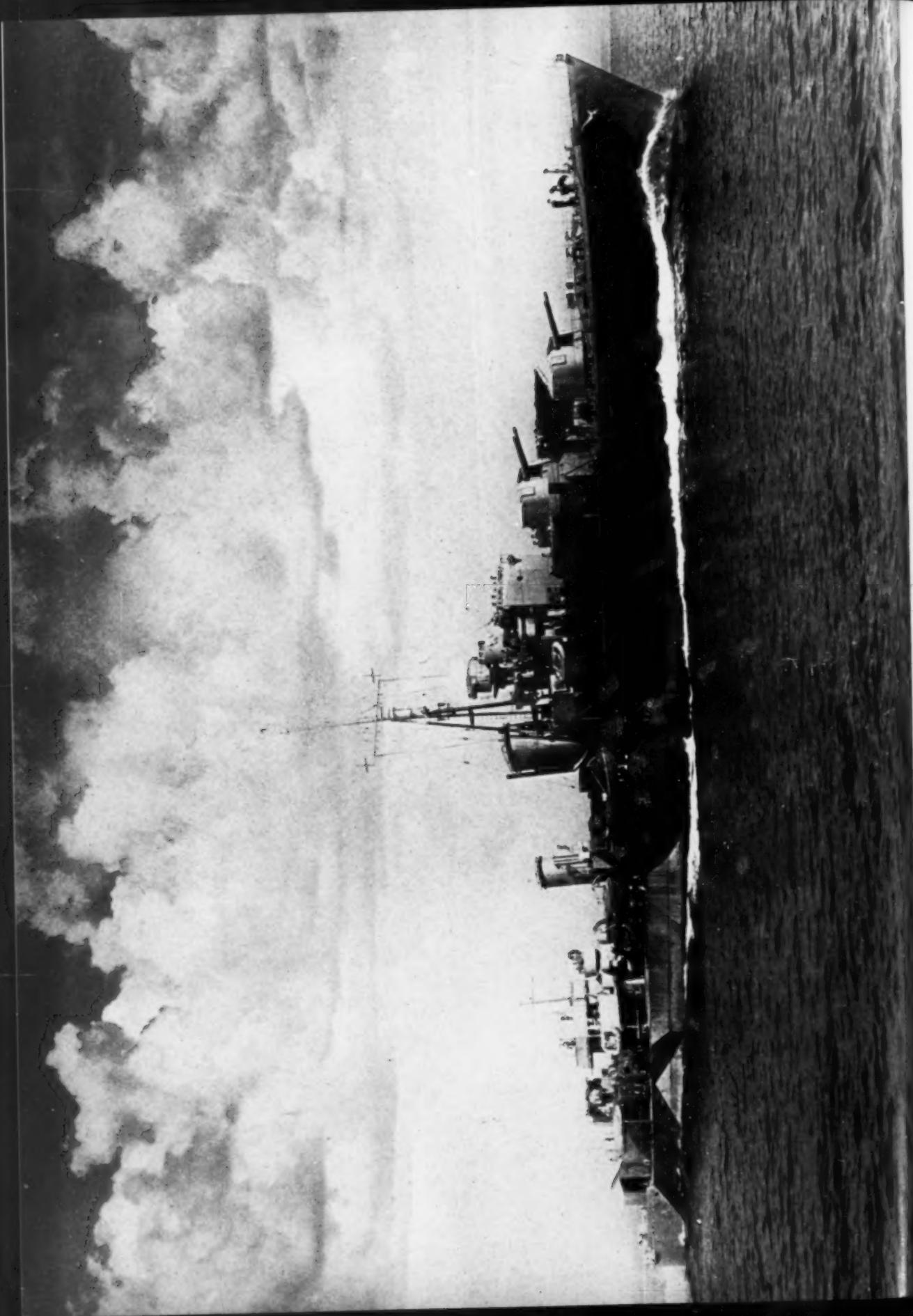




Captain J. M. Grant, R.C.N., Commanding Officer of the Royal Canadian Naval College near Victoria, B.C., shown here with one of the senior cadets and friend after the college's first graduation exercises.



A typical Canadian naval cadet is shown here, left and above. He wears an officer's cap badge and the familiar white twist on the lapels of his uniform. A white cord, or lanyard, looped around his neck and into the breast pocket of his uniform completes the identification.



Above:—H.M.C.S. *Ottawa*, one of the four destroyers recently turned over to the Royal Navy by the Royal Canadian Navy, is shown here. These ships, similar to those already possessed by the R.C.N. and formerly called the *Griffin*, *Decoy*, *Express* and *Fortune*, have been renamed *Ottawa*, *Kootenay*, *Saskatchewan* and *Calgary*. Each of these ships has undergone the most extensive refit and now are amongst the most completely efficient fighting ships of the Canadian Navy.

At top:—H.M.C.S. *Iroquois*, powerful new 'Tribal' class destroyer who with H.M.C.S. *Haida*, *Huron* and *Albion* of the same class, will constitute one of the strongest striking forces of the Royal Canadian Navy. A fifth Tribal, H.M.C.S. *Micmac*, was launched recently at an eastern Canadian port and the sixth is in her crib at the same shipyard, to be launched shortly.



phasis is, as it should be, on the practical. Full-sized models, and scale models are employed, both of ships and of armament. The fullest possible training in seamanship is given. Look-out duty is taught, and practised, in a huge room in which is set up a model corvette bridge. A skilful arrangement of lighting and models produces amazingly realistic effects. Sunrise, the half-light of dawn, full daylight, dusk and night . . . all are reproduced with accuracy; and over a grey-green sea move convoys and submarines.

A man might serve months at sea without encountering many of the conditions artificially produced by such training devices; but his training ashore would stand him in most excellent stead when he did.

Although there are many other training devices, from a full-sized model ship, complete with bridge, voice pipes and depth-charge throwers to the arched dome in the gunnery school against which flies a model German plane for anti-aircraft ratings to practise on, sea-training is carried out as well. Several training ships, as well as a number of small boats, are attached to the establishment. The harbour is open to year-round navigation. Consequently, graduates from this finest of nautical schools are trained seamen by the time they go down to the sea to fight the enemy.

This establishment centralizes all training, including advanced courses for officers, and the training of new officers under the recently-introduced system whereby officer-candidates must first enter as Ordinary Seamen on the lower-deck—a system which has already proved itself successful.

The forward-looking policy of naval authorities is further evidenced by the graduation of the first class of officer cadets for the permanent R.C.N. from the Royal Canadian Naval College at Royal Roads, British Columbia. Averaging nineteen years of age, and coming from every part of the Dominion, twenty-five future officers of the R.C.N. (including, perhaps, a future Chief of Naval Staff) arrived some time in September at a United Kingdom port to serve their time as Midshipmen in the

cruisers and battleships of the Royal Navy.

Of the fifty cadets who entered the Royal Canadian Naval College some ten months ago, forty-three have now graduated as Midshipmen. Of these, two have entered the Paymaster Branch, and sixteen have elected to join the Volunteer Reserve Branch of the Navy, serving—as the phrase goes—for 'hostilities only'. The twenty-five Midshipmen (four of whom are engineers) are the first graduates of the present war. Their naval careers are already well founded as a result of their training at Royal Roads; the further training they are now to receive with the British naval forces will complete the foundation for a naval career which may well enough become the envy of every red-blooded Canadian boy.

There never was a fighting seaman, whether a newly joined Midshipman, or a full Admiral with years of sea-going behind him, who did not, in time of war, crave action. The actions of the R.C.N., within the past twelve months, have been numerous. For reasons of security, the vast majority must pass temporarily unrecorded. The record of submarine sinkings, for instance, is necessarily limited to those officially passed for publication. Of these there have been three, making a total of six for the duration of the war to date.

They represent neither the true scope of the Navy's ranging over the seas, nor the true measure of the Navy's success. Canadian keels have ploughed through the waters of the Caribbean, and the Mediterranean, as well as through the more familiar — and much colder — North Atlantic. In addition to the movements of Canadian ships there must be remembered the magnificent service rendered by some hundreds of Canadian personnel on service with the Royal Navy. Hot actions in the English Channel between fast-moving small craft, minesweeping from Tobruk in Africa to Torbay upon the Devon Coast, the shores of Sicily and Italy — these are but some of the tasks and localities undertaken by these men whose story is a saga all its own.

Seventeen Canadian corvettes took part in the great allied expedition to North

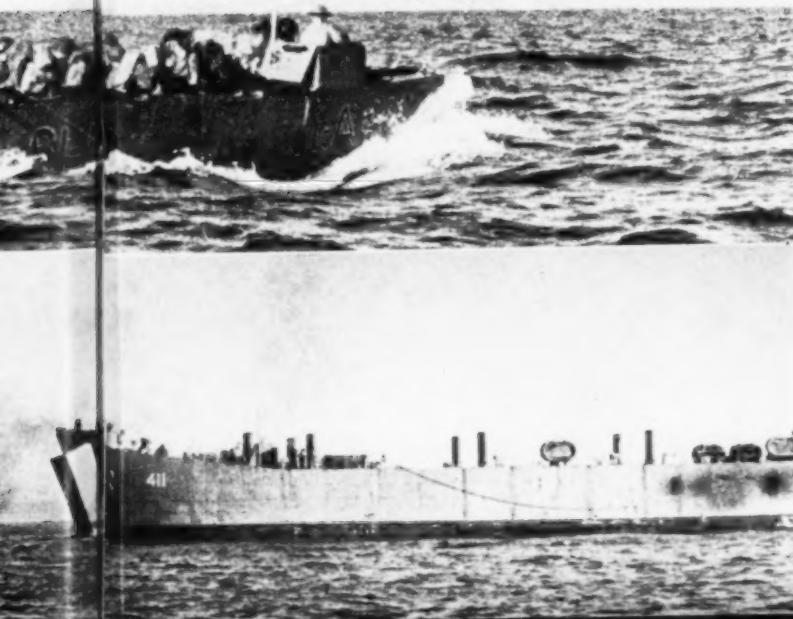
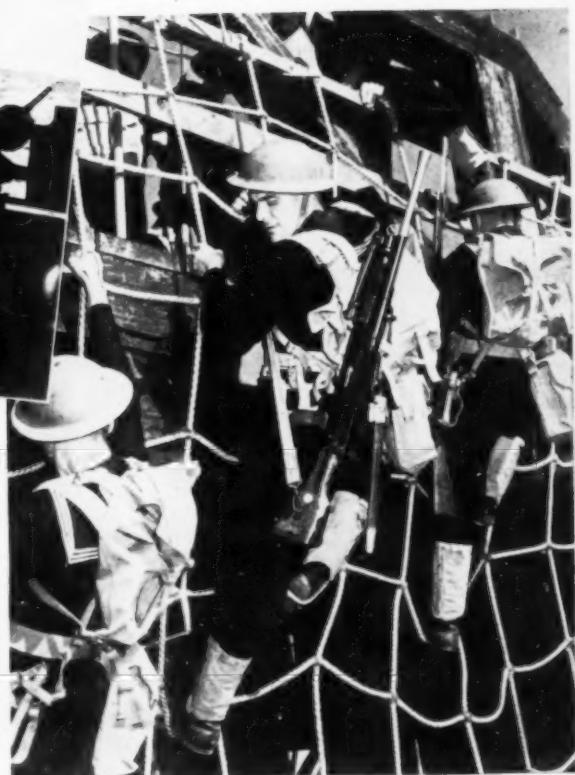


Months of hard, strenuous training under all possible conditions were carried out by the men of the Royal Canadian Navy in preparation for the landings at Sicily and on the beaches of Italy. As results proved, the training was not in vain.





Above:—An officer of the R.C.N. holds a briefing before the zero hour with the men who will handle the all-important landing craft and barges. Centre and above can be seen the craft underway as they approach the coast of Sicily.



Under full pack Canadian naval ratings train on scramble nets for the actual invasion shown on these pages. Besides manning landing craft, Canadian naval personnel took an important part in convoying troopships to the beachheads of Sicily and Italy.



Prime Minister Churchill is shown here after the Quebec conference as he prepares to leave Canada. In the background can be seen H.M.S. Renown, the ship on which he returned with Mrs. Churchill and daughter.



Vice-Admiral Percy Walker Nelles, R.C.N., Chief of Naval Staff, in spite of heavy duties at Naval Headquarters, keeps in close personal touch with the various naval bases. Above he inspects a guard of honour at an East Coast port.

Africa, fighting both submarines and aircraft as part of the job of getting those most vital of all convoys to their distant destinations. The fight was sometimes hot. Two fine ships — the corvettes *Louisburg* and *Weyburn* — were the price paid for the laurels won for Canada in this historic operation, whose success made possible the subsequent chain of victories and assured our final and complete control of the Mediterranean.

The toll exacted from the enemy — three submarines certainly destroyed, and certain other successes yet unpublished, as well as an undetermined number of his aircraft shot from the skies — was somewhat greater. *Port Arthur*, *Regina* and *Ville de Québec* were the lucky and successful ships concerned in the published destructions of U-boats. The Captain of the first-mentioned (Lieut.-Cdr. E. T. Simmons, D.S.O., D.S.C., R.C.N.V.R.) was the first Can-

adian officer to be decorated for two acknowledged successes against U-boats. He received his D.S.C. for his good work when First Lieutenant of H.M.C.S. *Chambly* which, in company with H.M.C.S. *Moose Jaw*, sank a U-Boat the latter part of 1941.

Some months previous to this, another corvette, the *Oakville*, depth-charged, gunned and rammed a submarine, which had been detected and attacked by a U.S. aircraft, in the Caribbean. This action was distinguished by the heroism of Lieutenant H. E. T. Lawrence, R.C.N.V.R., and Stoker Petty Officer A. J. Powell, R.C.N., who, armed only with revolvers, leapt aboard the submarine immediately following the ramming, and subjugated the crew. Lieut. Lawrence was awarded a Distinguished Service Cross, and P. O. Powell a Distinguished Service Medal. The citation for the former described the award



Rear-Admiral G. C. Jones, R.C.N. Vice-Chief of Naval Staff is shown here at H.M.C.S. Kings, Halifax, during presentation to graduating officers of that establishment.

as having been made for "gallant and courageous action in close contact with the enemy".

It must be remembered, however, that such actions, heroic, successful and certainly in keeping with the highest traditions of the Service, are but the high-spots in a continuously unfolding pattern of active achievement. The true measure of the work of the R.C.N. is to be found in the steady, and largely uninterrupted, flow of men and materials across the sea.

The enemy has again and again advertised his intention of staving off, and indeed averting altogether, his just retribution by so limiting the flow of men and materials by sea that no offensive against his "fortress" could be made.

Quite properly, his boasts have never been considered idle. Indeed, his measures to bring them to reality have been as ingenious and determined as anything he has done in this war. The daring of his commanders has certainly been respectable, although



Left:—Rear-Admiral L. W. Murray, R.C.N., Commander-in-Chief, Canadian Northwest Atlantic, is shown here with Lieutenant-Commander J. H. Stubbs, R.C.N. as they survey the damage done to H.M.C.S. Assiniboine after her successful encounter with an enemy sub.

Right:—Rear-Admiral Victor G. Brodeur, R.C.N., Commanding Officer Pacific Coast. Admiral Brodeur was formerly the Naval Member of the Canadian Joint Staff in Washington.

Extreme right: — Rear-Admiral (E) G. L. Stephens, R.C.N., Chief of Naval Engineering and Construction, is the Royal Canadian Navy's first Engineer Rear-Admiral. Admiral Stephens began his naval career years ago 'on the lower-deck.

misplaced. The technical developments of his submarines have been sufficient to enable him to take advantage of every soft spot — no matter how far out of his range some might have thought it to be. Yet, in spite of this unprecedented effort, in spite of a periodic success which has attended upon it, another year of U-boat warfare finds him noticeably less of a menace.

Speculation is idle, as well as dangerous, and there may be difficult days ahead once more; yet the fact remains that the convoys have gone through, and the 'fortress Europe' is now under attack.

In the above paragraph may be found the true measure of our Navy's achievement, represented by sleepless nights, and long, hard days of unending anxiety and vigilance, endured with that gay determination which is breathed by the men of the sea-going fighting fleet.

In a Service wherein team-work is of such great importance that it is the normal, rather than the unusual, the number of decorations awarded is necessarily small. Opportunities for distinction are limited, for success depends less upon the individual than upon the team-work of the ship's company as a whole.

Nevertheless, the tale of decorations awarded to R.C.N. personnel is impressive.

Here is a list made shortly before going to press:

Companion of the Most Honourable Order of Bath.....	2
Commander of the Most Excellent Order of the British Empire.....	4
Officer of the Most Excellent Order of the British Empire.....	22
Member of the Most Excellent Order of the British Empire.....	22
George Medal.....	6
Distinguished Service Order.....	5
Distinguished Service Cross.....	47
Conspicuous Gallantry Medal.....	1
Distinguished Service Medal.....	29
British Empire Medal.....	37
Mention in Despatches.....	231
Commendations.....	12
Naval General Service Medal (with "Palestine" bar).....	6
Albert Medal.....	1
Associate of the Royal Red Cross.....	2
Legion of Merit (U.S.A.).....	1
Polish Cross of Valour.....	4
Norwegian War Medal.....	2

It is obviously gratifying that, amongst the orders bestowed upon the Navy's senior officers, the Companionship of the



Order of the Bath should have been given to Vice-Admiral P. W. Nelles, who is responsible, not only for the present leadership of Canada's Senior Service, but who presided over and inspired that nucleus whose determination, foresight and planning have had so much to do with the growth and present increasing renown of the Navy.

Rear-Admiral G. C. Jones, C.B., R.C.N., for long in command of general operations and development on the vitally important Atlantic Coast, was similarly honoured.

Appointment as Commander of the Order of the British Empire, awarded to Rear-Admiral L. W. Murray, C.B.E., R.C.N., formerly Flag Officer Newfoundland Forces (now Commander-in-Chief, Canadian Northwest Atlantic), recognizes the immense value of the famed Newfoundland Escort Force under this officer's command, and of the splendid work achieved since the R.C.N. took over the development of the Newfoundland bases.

In Washington, the R.C.N. was represented, with obvious success, by Rear-Admiral V.G. Brodeur, C.B.E., R.C.N., to whom the same distinction has been awarded.

Canada's first Engineer Rear-Admiral, G. L. Stevens, C.B.E., R.C.N., whose naval career began years ago on the lower-deck,

has also received a C.B.E. in recognition of fine service as Chief of Naval Engineering and Construction.

A highly important contribution to the country's naval development made by W. Gordon Mills, Esq., C.M.G., Deputy Minister for Naval Services, and Civil and Financial Member of the Naval Board, has been most fittingly recognized by the award of Companionship in the Order of St. Michael and St. George.

Not the least significant of the awards won by officers serving with the R.C.N. was Commander of the Most Noble Order of the British Empire to Superintendent Joan Carpenter, W.R.N.S. Superintendent Carpenter was loaned to the Canadian Navy by the Royal Navy for the purpose of organizing the Women's Royal Canadian Naval Service, whose first recruit was entered as a rating in August of 1942.

This branch of the service has subsequently expanded to a total of approximately 4,000, and has proved that women can do many jobs necessary to the maintenance of a fleet-in-being hitherto performed by men. Some of these jobs, indeed, are done better by women than by men; all of them have had their effect upon the man-power situation of the Navy. Very large numbers of men, anxious to get to



Rear-Admiral H. E. Reid, R.C.N., Naval Member of the Canadian Joint Staff in Washington, was formerly Flag Officer Newfoundland Force.

sea, but held by necessary jobs ashore, have been released—the women of the W.R.C.N.S. winning both the privilege of the King's Uniform and the gratitude of the formerly shore-bound seamen at one and the same time.

The main initial training centre for the W.R.C.N.S. is now located at Galt, Ontario, and from there, in the past twelve months, have come 3,000 'Wrens' now carrying out a great variety of shore-duties including those of cooks, stewards, laundry assistants, coders, plotters, switchboard and teletype operators, sick berth attendants, supply assistants, messengers, drivers, wireless operators, writers and paywriters.

With this addition, the total strength of the Royal Canadian Navy—including the 'Wrens'—has now been brought up to 70,000 officers and ratings.

In May of this year came the announcement of the appointment of a Canadian officer as Commander-in-Chief, Canadian Northwest Atlantic. This appointment may be said to have recognized the steady achievement of the R.C.N. in the vital task of convoy-protection in the all-important Atlantic. Working as a team, with the R.C.A.F. under the operational control of the Air Officer Commanding in Chief of the Eastern Air Command, the Navy and R.C.A.F. have accepted a new, and tremendous responsibility.

The position of "C-in-C, CNA", as it is known in naval circles, is the counterpart of the more famous position of "Commander-in-Chief, Western Approaches" in the United Kingdom. Aircraft engaged on convoy escort duty now come under the general direction of the new Canadian Commander-in-Chief for that portion of the Atlantic under his control, and the whole conduct of anti-submarine warfare with regard to the trade convoys, upon whose arrival depend our hopes of victory, is now shared, in nearly equal proportions, by the Royal Canadian Navy and the British naval forces.

No greater tribute to the effectiveness of our fighting seaman could have been offered. The decision to make this appointment, arrived at in a joint conference attended by representatives from Great Britain, Canada and the United States, is an expression of high confidence in the ability of the Royal Canadian Navy to



Commander Adelaide Sinclair, W.R.C.N.S. who recently assumed the directorship of the Wrens, the youngest branch of the Canadian forces.

bear a great share in seeing that the goods are delivered.

Of the future of the Navy, obviously little can be said at present. The acquisition of what the Naval Minister, Hon. A. L. Macdonald, has described as a 'balanced Navy' seems, however, to be under way. The 'Tribal' class destroyers, a great advance on any fighting ship possessed by the R.C.N. to date will provide Canada with the nucleus of a striking force. It has been announced, moreover, that within a period of some months, it is now expected that the Canadian Navy will be acquiring two six-inch gun cruisers.

These are indications that the Navy is, at long last, to come into its own as a fighting service to be looked upon as a permanent necessity. This will be no more than the practical recognition of the actual dependence of this country upon her seaborne trade for the maintenance of the high standard of living of which Canadians are so justly proud.

Never did a fighting service earn recognition with greater determination, or a higher record of little-known achievement.



From all parts of the Dominion have come Canadian women to answer the call of the Women's Royal Canadian Naval Service. Over 4,000 of them are serving at ports and naval Stations on the East and West Coasts, in naval establishments at inland cities in Washington, D.C., Newfoundland and overseas. To replace men of the Royal Canadian Navy has been the basis for the organization and training of the Wrens. With little more than a year's existence, the Women's Royal Canadian Naval Service has more than



Wrens are now serving in over 24 different capacities, releasing thousands of sailors to serve with ships. Top left:—This Wren is typical of hundreds of girls serving as messengers at naval bases. Above:—A regular army of clerks has invaded naval offices releasing many men from desks for a more active part at sea. Right:—Wrens have taken over many positions in the Fleet Mail Office.



Canadian
s Royal
them are
East and
d cities
verseis.
as been
of the
ence, the
ore than

proved its worth by far surpassing the original quota decided upon.

The helm of the W.R.C.N.S. was turned over recently to all-Canadian hands when the British officers of the W.R.N.S., loaned by British Admiralty to assist in organization, returned to England. It is expected that Wrens will go over the 5,000 mark by March 1944, steadily replacing more and more men for duty at sea.



Top:—At the basic training establishment of Galt, Ontario, probationary wrens in white hats and cool shirtwaist dresses await orders of the day. Above:—A Wren models the new hat which will appear shortly. Left:—In Wrens' quarters, Wrens dine, cafeteria style, carry trays over to tables, and enjoy an informal leisurely meal.



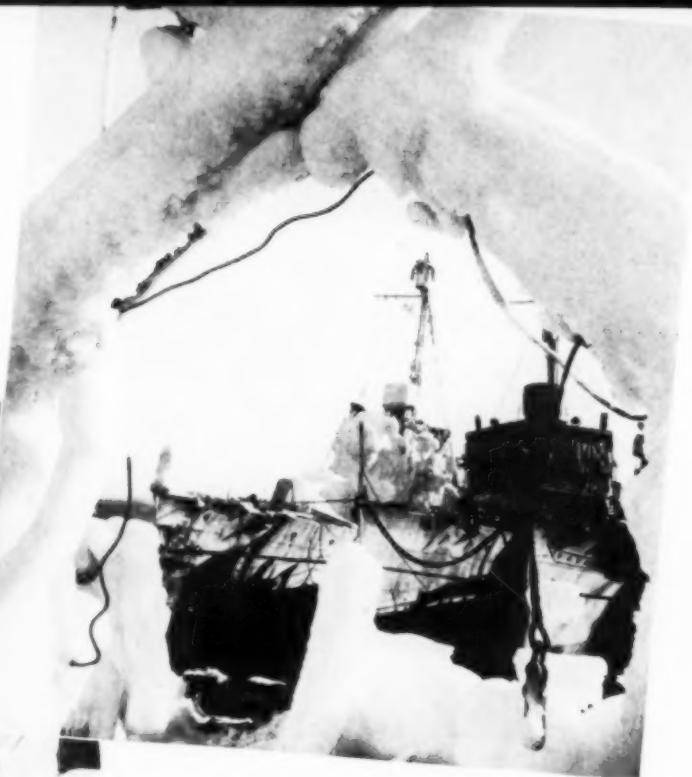
In the crowded mess deck of a destroyer (right) the captain holds a brief but impressive church service. Above:—Ammunition is about to be loaded into an M.T.B. somewhere in England. Overhead fly the barrage balloons.



Above:—Artist McNally shows a ship's surgeon as he tends a broken ankle in a destroyer wardroom. Right:—Canadian and British ratings relax at a naval base in England.

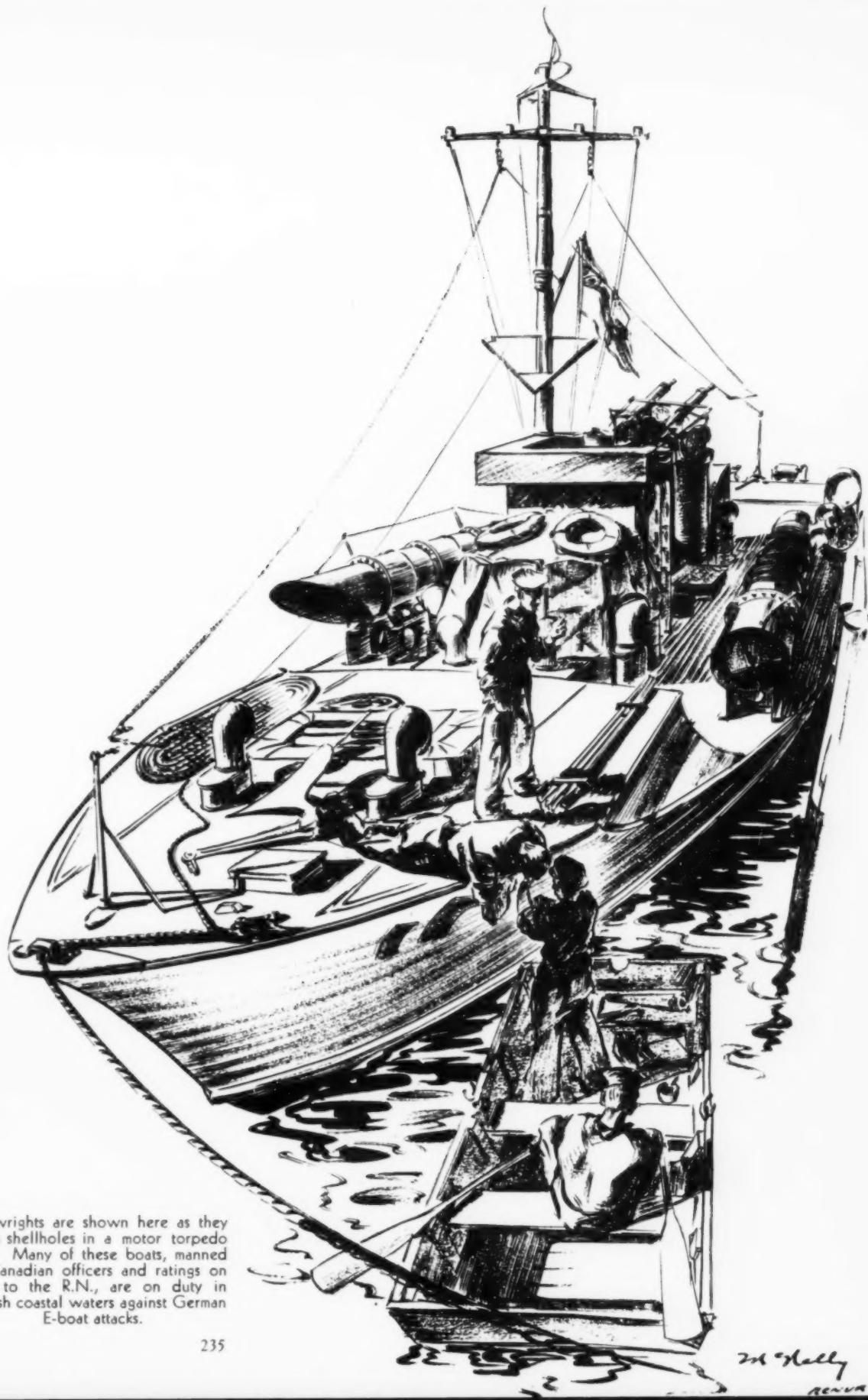


Last winter, the Royal Canadian Navy maintained its sea patrols and convoy duties through some of the worst storms that have ever swept the North Atlantic and Eastern Canadian seaboard in many winters. Forty-foot waves raked the ships from bow to stern and wind of gale force blew at 60-70 miles-per-hour for prolonged periods.

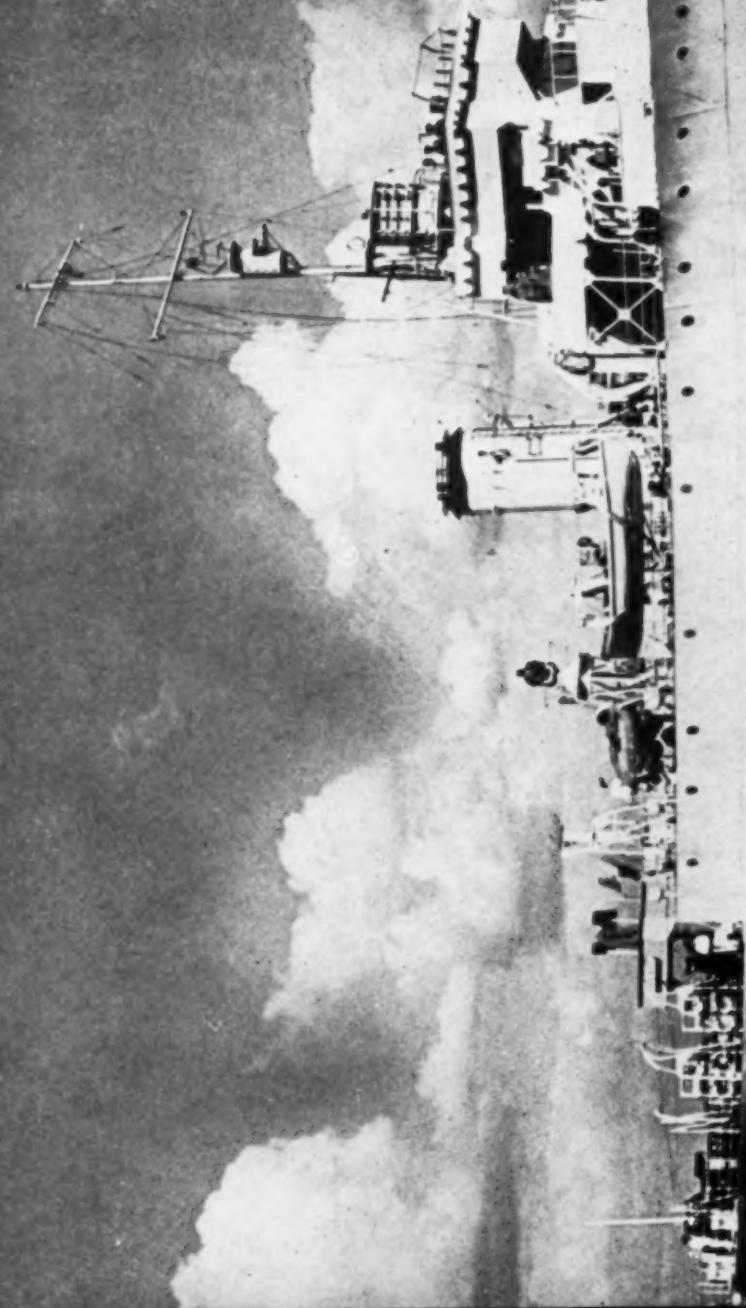


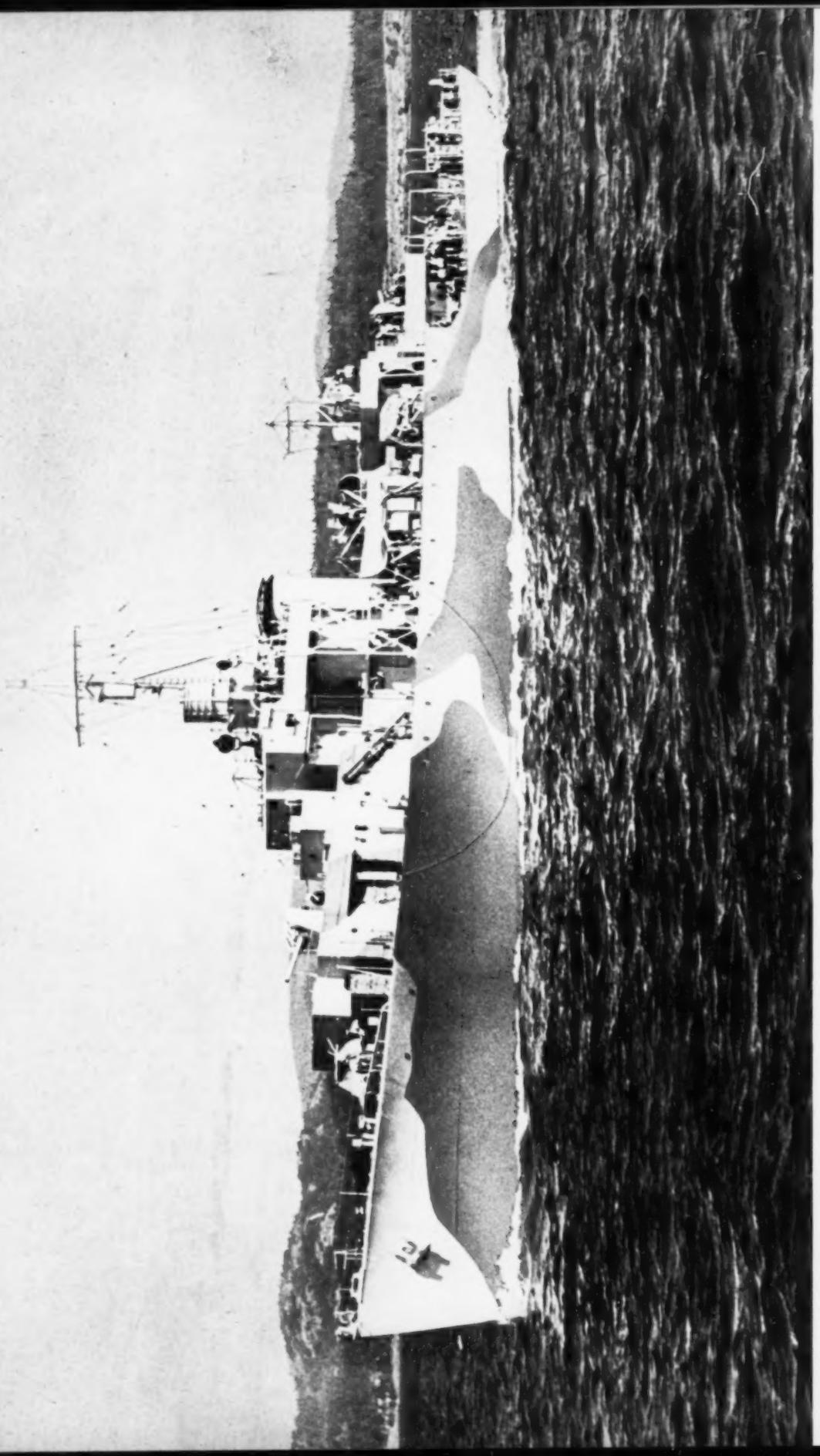
But convoys come and go as usual, and Canadian patrol craft continue to protect them. Top right:—Through the davits at the stern of a minesweeper can be seen the ice-covered destroyers. Left:—The ice and snow piled high on a patrol craft. Below:—A minesweeper plunges through an Atlantic gale.





Shipwrights are shown here as they patch shellholes in a motor torpedo boat. Many of these boats, manned by Canadian officers and ratings on loan to the R.N., are on duty in English coastal waters against German E-boat attacks.





above: Another new class of warship added to the Royal Canadian Navy is the 'Frigate' shown above. The frigate is the outcome of long and hard experience, and has been specifically designed to meet heaviest demands that may be made upon anti-submarine craft. Over 300 feet long, with advanced speed and firepower, this new type of fighting ship may be described as half-way between a corvette and a destroyer.

top: H.M.C.S. *Sault Ste. Marie*, one of the new 'Algerine' class minesweepers now being built in Canada for the Canadian Navy. Primarily designed for anti-mine work, they are fully capable of combining this duty with that of escorting convoys. Larger than any other type of Canadian minesweeper they are equipped with the latest armament and anti-submarine devices.



River barges laden with frames for bunk houses — and with trucks, each fully loaded with gas drums, pulls away from the Fort Smith dock — off on a week's trip to Norman Wells.

THE "CANOL" PROJECT

Canada Provides Oil for the Allies

by OLIVER B. HOPKINS*

LOCKED deep in the wilderness in the Canadian Northwest Territories, only a few miles from the Arctic Circle, four lone oil wells for years gave mute testimony to man's intrepidity in his search for the world's mineral wealth. Near a settlement marked by a pinpoint on the map, and known as Fort Norman, these wells yielded a mere trickle of oil, by the standard of American oil fields. From the time the first well was drilled in 1920 until the summer of 1942 they did their work faithfully and unspectacularly. Oil men the world over knew of their existence but regarded them largely as little more than an indication that oil existed in this very remote Arctic country in which they had been drilled.

Yet these four wells, operated for years merely to meet the small petroleum needs

of trappers, mines, an occasional aeroplane and river boats, were to become the nucleus of one of the world's most unusual oil fields — a field which was destined to grow in a matter of months not only in size and productivity, but to a position of international significance. These wells and their companion wells drilled since the late summer of 1942 are the source of crude oil for the now famous Canol Project, one of the most dramatic and interesting developments in the ever fascinating history of the oil industry.

"Canol" is a coined word, an abbreviated linking of "Canada" and "oil". Born of military necessity, and pushed forward against almost insurmountable odds by the teamwork of military and civilian authorities, the Canol Project is to-day ready to produce oil which to-

*Chief Geologist, Imperial Oil Limited



View of supplies and equipment awaiting transfer overland to Fort Smith.

morrow will help fuel the planes, ships and military and naval equipment used in the increasingly important Alaskan theatre of war.

Back in July of 1919 a party of eight geologists and drillers of Imperial Oil Limited left Edmonton on the long trek to Fort Norman, reaching their destination in September. Here they prospected the region in which the hardy Scot explorer, Alexander Mackenzie, had reported oil seepages more than a hundred years before and which had been described in 1888 as promising oil country by R. G. McConnel of the Geological Survey. Five of the group holed up there for the long Arctic winter, the others returned to civilization. In May of the following year, when river transport again was open, a group of seven pioneers again set out for Fort Norman, arriving there nearly two months later, on July 8th. The five hardy souls who had spent the winter at that lonely point welcomed them warmly. They had been living for the past month on a diet of flour and fish. During the same

season E. M. Kindle of the Geological Survey of Canada investigated the area, and his report, made in collaboration with Imperial Oil geologists, is the first detailed account of the new oil field. This and subsequent reports made by G. S. Hume, now Geologist to the Oil Controller, and Charles Camsell, C.M.G., present Deputy Minister of Mines and Resources, added to the fund of knowledge that was to have a bearing on the later development of the field.

The party lost no time in starting drilling operations on sites selected the previous summer. By August 20th oil poured forth over the top of the derrick and the first oil well in the Northwest Territories came into existence. Little did this band of oil men dream that summer's day that the work they brought to fruition was to play a significant role in the successful prosecution of World War II less than a quarter of a century later. Had they been able to look into a crystal ball on that historic occasion they might have seen oil pouring forth from this field in a steady



Oil barge approaching docks at Norman Wells refinery to take on fuel for trucks and other road-building equipment.

stream to fuel giant bombers, fleet destroyers, rugged merchantmen, heavily laden motor trucks and a variety of military equipment.

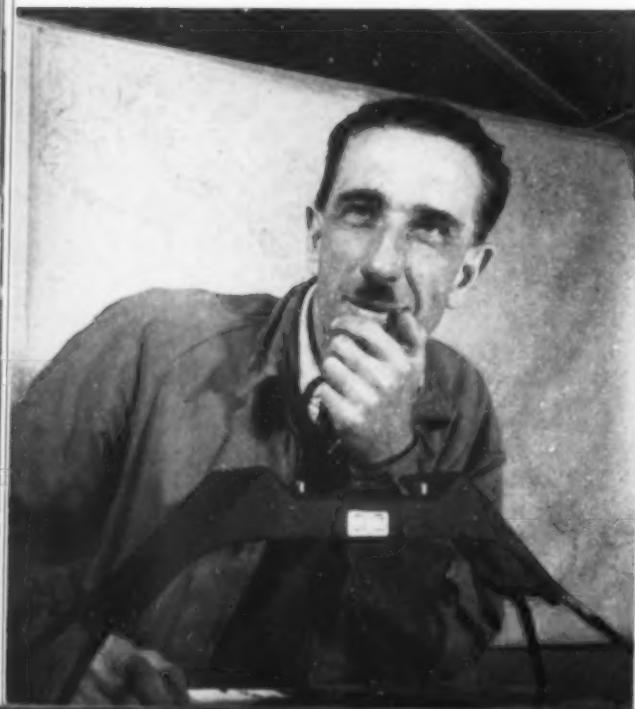
The Fort Norman field, however, was intended originally to play a constructive peace-time role. Imperial Oil, over the years, developed this source of petroleum to supply oil to a very limited market in the Northwest Territories. It was hoped that possibly the discovery of oil in that

region might stimulate an industrial awakening in the far north. However, early hopes of a developing market failed to materialize. Production was limited to a few thousand barrels of oil per year, and, by 1924, only six wells had been drilled, three of which were producers. A small refinery had also been constructed, but the market continued to be so restricted that in the same year the wells were capped and the refinery shut down.

By 1932 a new chapter in the history of Norman Wells opened. Rich mineral deposits had been discovered at nearby Great Bear Lake. River traffic mounted. River boats required gasoline and the mine machinery needed fuel oil. So the wells and refinery were reopened and production resumed.

The oil field lies in a muskeg-lake-hummock country of tremendous distances and vast areas untouched by man. The "routine" of oil deliveries was anything but routine at first. Barrels were loaded on waggons and hauled to the river's edge by dog teams. Barge facilities were inadequate and had to be constructed. The Bear River rapids barred one delivery route, and an eight and a half mile pipeline—one of the first product pipelines in history—was built in 1937 to circumvent them.

Theo. A. Link, chief geologist on project, examining aerial geological photos. Dr. Link, University of Chicago graduate, located the site of first well in the Norman field in 1919.





... working on opposite side of Mackenzie River. Pipelines now cross river and feed oil to Canol Company.

The following year the refinery was improved and a seventh well drilled. That year, too, equipment was installed to refine aviation gasoline. The aeroplane had begun to play an increasingly conspicuous and significant role in far north transportation—indeed, Imperial airmen made the first flight into the valley of the Mackenzie.

Geographically, the marketing area in this region encompasses thousands of square miles, but the market in terms of volume of products was small. In the language of the market analyst, it was diluted—by wilderness. In all of 1941 Imperial distributed from the Fort Norman field only about 80,000 gallons of aviation gasoline, 112,000 gallons of motor gasoline, 230,000 gallons of fuel oil. Typical customers were Eldorado Mines, the Hudson Bay Company, the Diocese of the Arctic, Slave Lake Gold Mines, United Air Services and Canadian Airways Limited, as well as what the company's books refer to as "sundry persons".

As a result of the development of this most northern oil field on the American continent, the price of gasoline at the refinery had been reduced from more than two dollars a gallon to about thirty cents a gallon. Petroleum products were being supplied where they were badly needed, and where they could otherwise have been shipped only under great difficulty and at high cost.

But the Fort Norman field, remote and small as it was, was not completely unknown outside of the oil industry. The military leaders of the United States, whose job it is to provide sources of petroleum for their armies and navies, had made note of Norman Wells for possible future reference.

The third chapter in its development started soon after the bombing of Pearl Harbour.

Allied military leaders knew that to defend Alaska and ultimately to strike at Japan from that territory would call for the use of tremendous quantities of fuel and equipment. Alaska was insular, accessible only by sea and air. True, it was possible to ship men and fuel to Alaska, but not only were our freighters and tankers strained to the breaking point in those early days of the war, there was the real and ever present threat of enemy action in Pacific waters.

To the military mind, trained to deal with realities as well as provide against contingencies, the answer was obvious—a road to Alaska and a source of fuel independent of the sea. The twin results were the Alaska Highway and the Canol Project.

Virtually overnight, Norman Wells, the only proved source of oil in the Great Northwest, became of vital military importance. To its one hundred odd customers



Long lines of pipe criss-cross at a tank farm somewhere along the Canol Project.

there was added a new one, the United States Army.

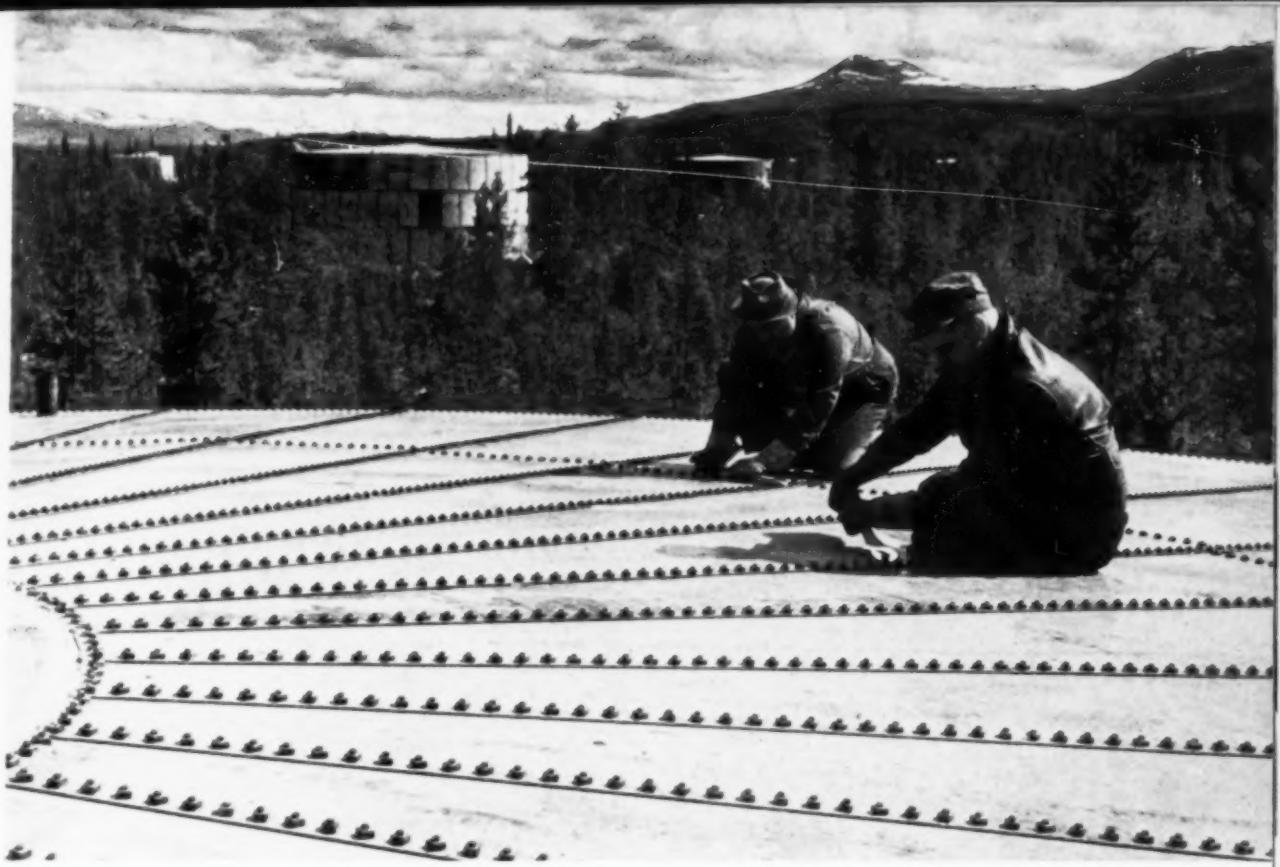
Late in April, 1942, officials of Imperial Oil Limited were summoned to Washington. There the Army outlined a plan for building a pipeline from Norman Wells 600 miles across the Mackenzie-Yukon divide to Whitehorse on the Alaska Highway, where it was proposed to build a refinery for processing the oil into the needed products. Crucial questions were how much oil could be produced at Norman Wells and how soon. The Army might need a lot and in a hurry. As the only commercial producer of oil in the region and with years of experience behind it, the Army looked to Imperial Oil for the answer.

The answers which had to be given were not too encouraging. The actual potential of the Norman oil field was not known because peace-time markets had not justified the drilling that is needed to determine an oil field's extent. Furthermore, the existing wells had been operated only during the short summer season, and, out of four potential producing wells, only three were actually in operation. It remained to be seen how the oil pool would behave under conditions of year-round

operation with a greatly increased number of wells. In the conservative judgment of experts, the chances of meeting the Army's requirements could be considered only fair. In addition, still other difficulties loomed — namely, the problem of securing personnel and equipment under war-time conditions, plus the further problem of transportation over primitive and inadequate facilities within the prescribed time limit. About the only definitely known favourable fact was that Norman oil will flow at temperatures as low as 70 degrees below zero, which meant that there were no serious obstacles to all-year operation or pipeline distribution even under the rigours of the Arctic winter.

Having outlined the difficulties, Imperial Oil Limited pledged its full co-operation, experience and facilities in the event that it was decided to go ahead.

On May 1st, the United States Government executed a contract in which details of Imperial's participation in the Canol Project were set forth, including the drilling of new wells and production of oil within a few months at many times the rate ever experienced or anticipated in the 22 years of Norman Wells' history. Under



Tightening bolts on top of huge storage tank at large tank farm somewhere along Canol pipeline. Tanks are shipped in sections and subsequently bolted together.

this contract the Army will obtain oil at prices comparable to those prevailing in the United States.

Immediately began the task of recruiting men and supplies — draining some of its other Canadian operations for the former and aided in the latter by special priorities. There was no time to be lost because winter descends early on Fort Norman and the waterways which lead to it from southern Canada.

When householders in Canada are beginning to think for the first time of flicking on the oil burner switch, the Mackenzie River is frozen and the initial blasts of winter have swept down from the bleak Arctic Circle. There was much to be done between that day in May and the day when the first icy winds would herald the onset of another trying season.

Work was begun simultaneously on various phases of the Canol Project by United States Army engineers, private contractors and Imperial Oil. By June a camp and loading facilities had been built at Waterways, the railhead 305 miles toward the polar regions from Edmonton. From that point it is a 285-mile haul down the Athabasca and Slave Rivers to Fort

Fitzgerald. Then comes a 16-mile portage necessitated by a series of rapids. The next leg of the arduous journey to Norman Wells calls for a 195-mile jaunt down the Slave River to Great Slave Lake, followed by a 125-mile trip across the lake to the head of the Mackenzie River. The final lap is a 550-mile trip down the river to Norman Wells.

That is transportation the hard way; no shiny rails of steel, no smooth concrete roads. River, portage, river, lake and river again!

The bare chronology of what happened in the fleeting months after May 1st is perhaps the most eloquent tribute to the amazing speed and efficiency with which the Army and Imperial working in close co-operation did an enormously difficult job.

By May a contract was signed in Washington. By the middle of June freight was flowing down the waterways bound for Norman Wells. On July 17th the first new well was brought in. By January, 1943, new producing wells had met the Army's original oil requirements, although it had meant pushing drilling operations through the bitter cold, snow and storms of winter.





op. centre:—General view of a pumping station under construction; many such will be required to boost oil from Norman Wells over mountain ranges to Alaska Highway.
1st row, top to bottom:—United States Army negroes load pilings on a barge at Fitzgerald.

he feminine invasion of Whitehorse, mostly by United States girls employed as office workers, on the Canol pipeline project, is effected by air, train and boat. Here a group of girls disembark at Whitehorse.

"Hep cats" in the North Country are members of a 15-piece negro band. They play for open air concerts and for dances at Fort Smith.

left:—Whitehorse has become a bustling centre with more than 15,000 men stationed in and around the town.

2nd row, bottom:—Lineup which occurs regularly thrice daily at the local theatre.

3rd row, top to bottom:—A derrick in operation at Norman Wells. Scores of wells will feed oil to the United Nations Pacific war machine through 500 miles of pipeline.

A landmark in Whitehorse is the Alcan quick lunch. his native of Los Angeles may be hundreds of miles from nowhere on Canol Project camp, but he still has the use of modern appliances.

below:—Sunday in Whitehorse: churchgoers leaving service held in a little log church—once place of worship for Robert W. Service and the gold miners he wrote about.





Along the Alaska Highway roar huge trucks carrying seven-ton loads of pipe. Here a load of pipe is being dumped. Pipe layers and welders will take over from here.

But the story does not end here. As soon as it became apparent that oil could be produced in considerable quantity the Army raised its objectives many times the initial quota, and Imperial to-day is hard at work to meet it.

The area of the Norman discovery well has proved much larger and more productive than was anticipated. Instead of being limited to a few million barrels, it is on the order of a major oil field—no East Texas to be sure, but comparable to the average major field in the United States.

Since January of this year other wells have been drilled, including a number of dry holes. In addition it has been found that a large portion of the oil structure lies beneath the river.

This fact, coupled with conditions peculiar to the area, has posed a new

challenge to oil men, making the maximum recovery of the field's potential a real problem.

Additional areas have been obtained from the Canadian Government and exploratory drilling is now being carried on intensively in the region surrounding the discovery well, where the pioneering geological work in years past had located promising structures.

In the meantime, an important reservoir of oil lies beneath capped wells waiting for the completion of the pipeline to Whitehorse. Imperial took no part in construction of this line or its terminal refinery. Construction crews working ever since last summer and through the winter from Whitehorse at one end and from Norman Wells at the other have made considerable progress. In so doing, Army engineers and



From a stockpile of firewood, photo shows an outpost of Fitzgerald, head of portage on Slave River. Hundreds of trucks and caterpillars are used to transport supplies, equipment, boats and barges along 16-mile overland route to Fort Smith.

Section of loading facilities at Fort Smith, northend of the 16-mile portage from Fitzgerald around impassable Pelican Rapids.





Above:—Soon black gold will be flowing through these pipes. Tightening a valve head.



Major-General Foster, Special Commissioner for Defence Project in Northwest Canada, and Col. J. Lyons (left), O.C., Post of Whitehorse, stop to chat with welders during General Foster's initial inspection trip.

workmen employed by private contractors have wrought a truly heroic saga. Roads have been blasted through the wilderness, airfields have been built, wharves and loading facilities constructed, until to-day the Fort Norman area is no longer linked to civilization by water route alone.

When the Canol Project is completed, oil will flow to Alaska secure from any possibility of attack that might threaten the otherwise normal route of supply by seaway and tankers.

It is a question what the end of the war will mean to Norman oil. Expanded only to meet military needs, the peace-time future of the field will probably depend on the peace-time development of the great Canadian Northwest.

Bottom right:—Typical workman on
Canol Project

Below:—"Monty Wooley" in the Yukon — Stanley "Tiny" Johnson, has been nicknamed "Monty" because of his striking resemblance to the actor. He is a native of Morris, Minnesota.



Dan Kralis, of Laporte, Indiana, a graduate in geology from the University of Indiana, is a member of a geological party working out of Norman Wells. Kralis finds the North a good place to work on his Ph.D. thesis.



The Canadian Geographical Society

OTTAWA, CANADA

HONORARY PATRON:

His Excellency Major-General the Earl of Athlone,
K.G., P.C., G.C.B., G.M.M.C., G.C.V.O., D.S.O.
CHARLES CAMSELL, C.M.G., B.A., LL.D., Honorary Presidents
R. C. TYRELL, M.A., LL.D., F.G.S.

BOARD OF DIRECTORS

GEORGE J. DESBARATS, C.M.G., D. App. Sc., President
CHARLES G. COWAN, Vice-President
LT.-GEN. A. G. L. MCNAUGHTON, Vice-President
Hon. W. A. BUCHANAN, Vice-President
R. C. WALLACE, Vice-President
Hon. A. E. ARSENALI, Assistant Judge, Supreme Court, Charlottetown, P.E.I.
MARIUS BARBEAU, National Museum of Canada, Ottawa
ARTHUR BEAUCHESNE, Clerk of the House of Commons, Ottawa
LAWRENCE J. BURPEE, Secretary for Canada, International Joint Commission, Ottawa
CHARLES CAMSELL, Deputy Minister, Department of Mines and Resources, Ottawa
AUGUSTIN FRIGON, Montreal, P.Q.
MAJ.-GEN. W. W. FOSTER, Vancouver, B.C.
K. A. GREENE, Ottawa
GILBERT A. LABINE, Toronto, Ont.
F. C. C. LYNCH, Department of Mines and Resources, Ottawa
B. R. MACKAY, Department of Mines and Resources, Ottawa

J. A. WILSON, Vice-President
O. M. BIGGAR, K.C., Honorary Counsel
K. G. CHIPMAN, Honorary Treasurer
E. S. MARTINDALE, Honorary Secretary
LT.-COL. L. T. MARTIN, Ottawa

Dean C. J. MACKENZIE, Acting President of National Research Council, Ottawa

LT.-COL. SIDNEY C. OLAND, Halifax, N.S.

F. H. PETERS, Surveyor-General of Canada, Ottawa

H. M. SNYDER, Montreal, P.Q.

E. J. TARR, K.C., Winnipeg, Man.

GRIFFITH TAYLOR, University of Toronto, Toronto, Ont.

J. C. WEBSTER, Shédiac, N.B.

Editorial Committee

F. C. C. LYNCH, Ottawa *Chairman*
F. D. L. SMITH, Toronto
Hon. W. A. BUCHANAN, Lethbridge
H. L. TRUEMAN, Ottawa
Hon. A. E. ARSENALI, Charlottetown

Lt.-Col. G. L. P. GRANT-SUTTIE, Toronto
M. Y. WILLIAMS, Vancouver
D. C. HARVEY, Halifax
J. C. WEBSTER, Shédiac
F. J. ALCOCK, Ottawa
ROBERT ENGLAND, Ottawa
JAMES SPENCE, London, England

GORDON M. DALLYN, *Secretary*
W. EGGLESTON, Ottawa
A. B. WATT, Edmonton
OLIVER MASTER, Ottawa
GEORGE W. BROWN, Toronto
ROBT. J. C. STEAD, Ottawa

Executive Secretary and Editor

GORDON M. DALLYN

Auditors

DAVIS, BOYCE & COMPANY
Chartered Accountants



The men of Canada's shipyards are seeing to it that food and war materials get to the front. Day and night the "heat is on" to win the battle of the supply lines. We of Davie Shipbuilding and Repairing Company are proud of the part we have played in producing an increasing number of 10,000-ton cargo vessels and ships of war.

DAVIE SHIPBUILDING and REPAIRING CO.

715 VICTORIA SQUARE

Montreal

EDITOR'S NOTE-BOOK

Lieutenant-Commander William Strange, R.C.N.V.R., author of "The Royal Canadian Navy, 1942-1943", was trained at the Royal Naval Colleges at Osborne and Dartmouth during the last war; in 1918 he left the Royal Navy owing to defective eyesight. Before taking up writing as a career, he prospected for oil in the West Indies, lectured in English for the Egyptian Government in Cairo, and managed a sales company in Toronto. He has done a considerable amount of journalism, is author of three books (*Sunset in Ebony, Canada, the Pacific and War*, and *Into the Blitz*), and literally hundreds of radio plays and features. His feature, *Quiet Victory*, won First Award in the War Effort category from the Institution for Education by Radio at Columbus, Ohio, — one of the highest awards on the American continent. Lieutenant-Commander Strange joined the R.C.N.V.R. in January of 1942, has served for short periods in both corvettes and destroyers, and is now Assistant-Director of Naval Information at Ottawa.

Oliver B. Hopkins, A.B., Ph.D., whose article, "The 'Canol' Project", appears in this month's Journal, has been associated with oil development in Canada since 1919, when he joined Imperial Oil Limited and became engaged in oil exploration in the foothills of Alberta and British Columbia. In 1920 he became Chief Geologist of Imperial Oil Limited, and since that time has been in charge of the Company's exploratory work in Canada. As a Director of the International Petroleum Company, Dr. Hopkins is also in charge of exploratory work in South America—in Colombia, Ecuador and Peru. He has contributed liberally to geological literature, having several books, as well as numerous articles, to his credit.

AMONGST THE NEW BOOKS

Arctic Trader by PHILIP H. GODSELL, MacMillan Co., Toronto \$1.98.

This book was first published some years ago and has already gone through several printings. The present edition has been slightly revised, but differs in no essential feature from the original. Mr. Godsell was for more than twenty years an employee of the Hudson's Bay Company, his

service covering, in the main, the period of transition in the fur trade from the pattern that had been set at the time of the amalgamation of the Hudson's Bay Company with the Nor'wester's, a hundred and thirty years ago, to the trade of the present day when the picturesque fur brigade no longer pushes through the northern rivers but supplies go in by aeroplane and every post has two-way radio communication. That period has seen the Hudson's Bay Company lose, in a measure, to the free trader and free trapper its pre-eminent place in the fur trade, a condition due to some extent to the system of remote and oligarchical control developed by the Company.

Mr. Godsell tells the story of his service from his voyage to Hudson Bay in the auxiliary ship *Pelican* through various trading posts in Ontario and the Northwest to the final period when he was in responsible charge of the posts on the MacKenzie and in the Western Arctic. The result is a vivid account of a period that, though so recent, will never return. Indians, docile and otherwise; traders whose loyalty to the old Company transcended their regard for the law and all other human relationships; Eskimo, puzzled and amazed in the contact of their stone-age culture with the ways and arts of the white man; medicine men and ritual murders in the darkness of the winter forest, and the grim story of the trial of the Eskimo murderers at Herschel Island when the judge, the crown prosecutor, the counsel for the defence, the hangman and the wood for the scaffold all went north on the same boat, and the latter functionary lived in close association with his victims for several months.

The later chapters of the book are much better than the first where one has a feeling that much of our author's story has been coloured by the romance of a half-forgotten youth. In all, a book well worth reading and important as an informal record of one phase of Canada's first great industry.

P. E. P.

R

*Serving Canada's
War Production Line*

MOUNT ROYAL • MONTREAL
VERNON G. CARDY, General Manager

KING EDWARD • TORONTO
P. KIRBY HUNT, Manager

ROYAL CONNAUGHT HAMILTON
H. ALEXANDER MACLENNAN, Manager

GENERAL BROCK NIAGARA FALLS
RONALD P. PECK, Manager

PRINCE EDWARD • WINDSOR
HARRY A. PETERS, Jr., Manager

CANADA'S ROYAL FAMILY OF HOTELS
DIRECTION VERNON G. CARDY

SHIPBUILDERS
DREDGING
CONTRACTORS



MARINE
ENGINEERS

MARINE INDUSTRIES LIMITED

J. SIMARD, O.B.E., President
J. ED. SIMARD

DIRECTORS:
E. de G. POWER
Col. H. S. TOBIN, D.S.O.
WALTER LAMBERT, M.I.N.A.

P. A. LAVALLEE
A. LUDGER SIMARD

Cable
"Marindus"

Plants at
Sorel, P.Q., Quebec, P. Q., Vancouver, B.C.

Executive Offices: Marine Building, 1405 Peel Street, MONTREAL, QUE.

One way to help!

Men who fight for Canada on sea or land or air, lead a hard life . . . harder than most civilians can imagine. The little luxuries mean a lot to these men and the little luxuries are not easily come by in war-torn Europe. That's why we appeal again for your support of:

The Overseas League Tobacco Fund, 51 King St. E., Toronto

\$1 to them means 400 cigarettes delivered to a sailor, soldier or airman who really needs them. Send a subscription—as large as you can make it, today! The Fund only sends cigarettes for general distribution and cannot accept orders for individuals.

This is contributed by

John Labatt Limited
LONDON • CANADA

AMONGST THE NEW BOOKS (Continued)

Meeting the Mammals by VICTOR H. CAHALANE, in charge, Section on National Park Wildlife, Fish and Wildlife Service. With drawings by Walter A. Weber, formerly Chief Scientific Illustrator, Museum Division, National Park Service. The Macmillan Company, New York, 1943, pp. ix, 133. (The Macmillan Company of Canada, St. Martin's House, Toronto. \$2.00).

This is primarily a book for tourists who are interested in the more obvious aspects of the mammal life in the areas of the United States National Park System west of the Mississippi River. The large map showing the locations of the 73 National Parks and Monuments of over 50,000 acres in extent, including thirteen and one-half million acres in 17 States, with tables listing the more distinctive species found therein, gives an impressive glimpse of the recent extension of far-reaching policies of conservation, public education and recreation in the Western United States.

The general policy is to keep the larger portion of these areas as nearly as possible in their primitive condition, leaving a natural habitat for the species originally found there. It is of course impracticable to retain all the species which may have been found in the smaller areas, as they wander outside and disappear, and the author states that the recently common large wolf is no longer known to live in the Western National Parks. An interesting light on the growing scarcity of some of our most valuable fur-bearers, and the difficulty met in preserving them, is that it is necessary to withhold information on the home localities of some of the rarer species to augment the usual protection offered the wild life.

After many experimental control measures the present policy of the United States National Parks is to allow each species to carry on its struggle for existence unaided, as being to its ultimate good, unless there is real cause to believe that it will perish if unassisted. The number of large grazing mammals on a deteriorated range is not permitted to exceed its reduced carrying capacity, and no native predator is destroyed on account of its normal utilization of any other park animal, unless that animal is in immediate danger of extermination, and then only if the predator is not in itself a vanishing form. Any native species or subspecies which has been exterminated in any park may be brought back if this is practicable, but exotic species are either eliminated or held to a minimum, and further invasion of the parks by exotic species is prevented wherever possible.

While the book does not pretend to be a complete catalogue of the animals found in the parks, brief popular accounts are given of the most noteworthy habits of sixty kinds or groups of allied species. Some exceptions could be taken to a tendency to "wise-cracking", and a few broad generalizations which attempt to cover too wide a field, but the book gives much light on how and where to see the mammals in life under natural conditions. The 52 illustrative line and wash drawings are lifelike and striking, and, to most lovers of natural history who are "eye-minded", are undoubtedly attractive. As all but about half a dozen of the different kinds of animals "met" in this book are also found in Western Canada it will have an added interest to Canadian readers.

R. M. A.

"Jerry won't use that factory again, Skipper!"

ANOTHER WAR PLANT
FLATTENED! Another
submarine base blasted!

Another transport column blown into a tangle of scrap iron! Every night the R.C.A.F. attack teams tell of the havoc their bombs are spreading.

Perhaps you, too, can share in these thrilling days and nights of flying adventure. The biggest job is still to be done. What is to prevent you from getting into the fight?

If you are physically fit, mentally alert, 17 or over and not yet 33, you are eligible for aircrew. High School education is no longer necessary. Ground crew are also needed—age 17½ to 50—men who are unfit for active duty with the Army or Navy but keen to get into a fighting service. Go to an R.C.A.F. Recruiting Centre today. If you are under age for aircrew enlistment, join your local Air Cadet Squadron.



ROYAL CANADIAN AIR FORCE

Recruiting Centres are located in all the principal cities in Canada.
Mobile recruiting units visit smaller centres regularly.



We both like *Apple Pie and Cheese!*

• We of Canada and the United States are the world's outstanding example of "good neighbours".

We are unique in our understanding of one another, in our mutual confidence, in our fellowship.

And the things which make us good neighbours are as basic as our common liking for apple pie and cheese.

We speak the same language.

We enjoy the same jokes.

We sing the same songs.

We play the same games.

We work and worship to the same ends.

One of us flying the Union Jack, the other the Stars and Stripes, we both nourish deep in our hearts the same concept of freedom, the same human ideals. And we share an indomitable determination that no one shall ever take them from us.

* * *

Today our soldiers fight side by side in all parts of the world. And our citizens work shoulder to shoulder to supply them and support them in their grim task. We of The House of Seagram are proud that our great plants in Canada and the United States are manned by thousands of Canadians and Americans working together . . . engaged 100% in the production of high-proof Alcohol for War.

THE HOUSE OF SEAGRAM